Cool and Carefree Cotton Seersucker

GEORGE J. KYAME *and* JOHN T. LOFTON

Those among us who are old enough to remember the "roaring twenties," approximately two generations ago, will recall that man's most comfortable dress wear during hot, humid, summer months was a gray-and-white striped suit that not only looked cool, but felt cool as well. We could wear the suit in relative comfort for hours on end. What made this possible? It was the unique structure of the fabric from which it was made, a structure of alternating flat and crinkle (puckered) stripes. The cool secret? The pucker stripe—it kept the fabric from clinging to the body, thereby allowing air to circulate between the body and the garment.

The fabric, commonly known as seersucker, is easily woven on any textile loom adapted to weaving light and medium weight cotton goods. To make the fabric, two loom beams are needed instead of the single beam used in weaving most other fabrics. One beam carries warp yarns for the flat stripe; the other, warp yarns for the pucker stripe. During weaving, adjustments are made to make the pucker stripe warp yarns feed forward faster than the flat stripe warp yarns. This results in localized buckling of the fabric in the areas of the fast-feeding yarns, first one way, then the other. This produces the pucker in the pucker stripe.

Despite its comfort advantages, the popularity of seersucker began to wane. By the early thirties, men's seersucker suits were fast disappearing. Why? Perhaps it was the wrinkling and bagging of the suit, making laundering necessary after even short periods of wear. Or it might have been the use of "plissés"—seersucker-type fabrics with chemically produced pucker stripes—which failed to hold shape or size in the garment. In any event, a market for cotton was lost.

The problem, then, was one of preventing wrinkling and maintaining pressed-in creases. In 1928, the first patent in this field was granted to Foulds, Marsh, and Wood, three British scientists, for a chemical treatment which would reduce the wrinkling tendencies of cotton and cottonlike fabrics. Ever since, researchers have been seeking better treatments which would ease the care of cotton garments. Their goal was, and still is, a treatment which would produce a launderable cotton garment that would come out of the clothes drier wrinkle free and ready to wear without ironing.

Many treatments and new chemical compounds have been developed, some good, but none ideal. The treatments

∴ ∴ ∴

GEORGE J. KYAME *is a Research Physicist and Project Leader with the Southern Regional Research Laboratory, Agricultural Research Service, New Orleans.*

JOHN T. LOFTON *is a Research Textile Technologist and Project Leader with the Southern Regional Research Laboratory.*

were effective in preventing wrinkling, but usually caused major losses in the strength of the treated fabric. Here then was a target for research, namely, what to do to minimize or prevent these strength losses.

In June 1964, the Southern Regional Research Laboratory at New Orleans attacked the problem from the standpoint of fabric structure. The authors of this chapter set out to find what part fabric structure played in the ease-of-care picture, and how structure could best be used to counteract undesirable effects of the new chemical treatments.

As a starter, we tackled the revival of the seersucker suit of old, as this offered a great potential market for cotton in men's suits. We designed an all-cotton seersucker fabric with sufficient initial strength so that, when it was given wrinkle-resisting and crease-retaining properties, it would still retain strength sufficient to withstand all the rigors of repeated wear and laundering.

We made yarns for the fabric from the strongest American-grown cotton we could get (Pima S–2) and subjected them to a special mercerizing treatment developed at this laboratory by A. L. Murphy and coworkers. Two hundred yards of the woven fabric were sent to the National Cotton Council of America to be treated and service tested. We treated and tested 50 yards of the fabric to determine its performance in the washing machine. For this test, we made short-length, cuffed trouser legs which were washed and tumble-dried 30 times in home-type laundering equipment. Despite all this washing and drying, each trouser leg still retained its creases and wrinkle-free appearance and developed from one to not more than three tiny holes, mostly at the cuff corners.

In the meantime, the Cotton Council had their 200 yards of fabric treated by a textile mill and tailored into suits by a garmentmaker. The suits were distributed among staff members and others for testing in everyday use.

New cotton seersucker garments developed for modern living.

Fabric identification	Kind of yarn [1]			Mercerizing treatment	Average number of holes per cuff after 55 launderings
	Flat stripe	Filling	Pucker stripe		
A	ply	ply	ply	special	0.5
B	ply	ply	singles	conventional	1.7
C	singles	ply	singles	conventional	2.2
D	ply	singles	singles	conventional	7.8
E	singles	singles	singles	conventional	4.5

[1] Yarns for fabric A were made from expensive, Pima S–2 cotton. Yarns for fabrics B through E were made from a shorter staple cotton of moderate cost.

The preliminary results were so encouraging that the Council initiated a test-marketing program as part of its research and promotion activity on cotton suits in the summer of 1966. They had a textile mill weave and treat 3,500 yards of seersucker fabric made substantially to specifications set up by the Southern Regional Research Laboratory. The treated fabric was fashioned into about 700 men's suits which were put on sale in six major cities in the United States.

Response of the public was favorable; not a single complaint was received. Several well-known converters (fabric finishers, garment manufacturers, etc.) became interested and wanted to add seersuckers to their lines. In fact, one of these converters placed an order for 10,000 yards of all-cotton seersucker fabric for suits that were to be marketed in the spring of 1968. The future of our old friend looks quite rosy.

Our research did not end there. Our next step was to reduce fabric production costs. You will remember we made our yarns from the strongest cotton we could buy and mercerized them in a special way. Not only that, but we had also plied our yarns, i.e., twisted two strands of the singles yarns together to form a single strand of two-ply yarn. All this added to the cost of producing the fabric. Consequently, we were interested in finding out whether we could use singles yarns made from less costly cotton and mercerized in conventional manner and still produce an adequate fabric. So, we wove four different fabrics, all with singles yarns in the pucker stripes, but differing as to the type of yarn—singles or two ply—in the flat stripe and in the filling.

As before, we treated the fabrics, made test trouser cuffs from each, and subjected the cuffs to 55 cycles of laundering and tumble drying in home-type machines. To make a long story short, we found that each substitution of singles yarns for ply yarn reduced the strength (breaking, tearing, and bursting) of the fabric and reduced its resistance to wear in laundering.

The table shows how these fabrics performed during the repeated laundering tests.

Fabric A, made from plied, Pima S–2 yarns was obviously the best of the fabrics, but that was to be expected. Fabrics B and C averaged less than three holes in 55 launderings. This would indicate that an adequate fabric could be made from less costly cotton and cheaper mercerizing procedures. It should be mentioned that other tests showed all five fabrics to have about the same wrinkle-resisting and crease-retaining properties.

Although our research was slanted toward seersuckers for men's suiting, the new durable-press fabric and the production techniques that produced it are applicable as well to women's and children's wear. One converter's interest in all-cotton, durable-press seersucker has prompted him to embark on a marketing program of his own. Others are bound to follow. The entire family will soon enjoy the comfort of cotton seersucker and benefit from its newly acquired, ease-of-care characteristics.